2nd Biannual Report: The Early Action Compact for the San Antonio Region

December 2003

Prepared by the Alamo Area Council of Governments

This document was reviewed and approved by the AIR Technical Committee on December 8th, 2003. It will be forwarded to the AIR Executive / Advisory Committees for their final approval on December 22nd, 2003.

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Abstract:
Protocol for the Early Action Compact (EAC) stipulates that areas participating in the compact will assess and report their progress against milestones every six months. The Clean Air Plan for the San Antonio Metropolitan Statistical Area (MSA) details and demonstrates the region's commitment to achieving and maintaining the 8-hour ozone standard through regional voluntary efforts. The implementation of the Clean Air Plan occurs through progress against prescribed milestones stipulated by the Environmental Protection Agency on a set timeline. Several milestones were accomplished from June 2003 to December 2003, to include several modeling milestones, various control strategy milestones, and on-going progress against the public involvement milestone. The progress against the milestones is discussed.

Related Reports: 1st Biannual Report: The Early Action Compact for the San Antonio Metropolitan Statistical Area	**Distribution Statement:**	**Permanent File:** Alamo Area Council of Governments, Natural Resources / Transportation Department
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Table of Contents

List of Tables

List of Figures

Chapter 1 – Introduction

San Antonio, Texas is currently the largest corporate city in the nation that is not designated in non-attainment for any of the criteria pollutants under the national ambient air quality standards (NAAQS). However, during the ozone seasons of 2000 through 2002, local air quality monitors recorded ozone levels above the concentrations allowed under the 8-hour ozone NAAQS. Moreover, in June of 2002, area monitors recorded some of the highest 8-hour and 1-hour ozone values on record since 1998[1]. Since US Environmental Protection Agency (EPA) guidance suggests that the boundary of the Metropolitan Statistical Area be considered as the boundaries for new 8-hour ozone non-attainment areas, air quality planning has focused on Bexar, Comal, Guadalupe and Wilson Counties. These four counties are called "the San Antonio EAC region" in this document since they comprised the Metropolitan Statistical Area of San Antonio on December 9, 2002, the signing date of the Early Action Compact (EAC) for the San Antonio region. The local signatory governments to the EAC are within these four counties.

1.1 Clean Air Plan

The Early Action Compact protocol is designed to guide development and implementation of control strategies, including planning for near-term growth, in order to achieve and maintain the 8-hour ozone standard. This compact offers a more expeditious time line for achieving emission reductions than the EPA's draft 8-hour implementation rulemaking[2], while providing "fail-safe" provisions for the area to revert to the traditional State Implementation Plan (SIP) process if specific milestones are not met. In general, these early action plans will include all necessary elements of a comprehensive air quality plan, but are tailored to local needs and driven by local decisions. The EAC agreement signed by the EPA, the Texas Commission on Environmental Quality (TCEQ) and local elected officials is available online: http://www.aacog.com/cap/.

The EAC represented a commitment to plan. The Clean Air Plan embodies and

[1] On June 24, 2002, the CAMS 23 monitor, located near Marshall High School in San Antonio, recorded a 1-hour average ozone value of 126 parts per billion (ppb), an exceedance of the 1-hour ozone NAAQS. The most recent exceedance of the 1-hour standard prior to this date was 141 ppb recorded September 4, 1998 at CAMS 58 in Camp Bullis. Also on June 24, 2002, the CAMS 23 monitor recorded an 8-hour average ozone reading of 110 ppb, an exceedance of the 8-hour average ozone NAAQS. The most recent 8-hour reading prior to this date above 100 ppb was a reading of 110 ppb recorded September 4, 1998 at CAMS 58 in Camp Bullis.

[2] "Proposed Rule To Implement the 8-Hour Ozone National Ambient Air Quality Standard," June 2, 2003. Available online http://www.epa.gov/fedrgstr/EPA-AIR/2003/June/Day-02/a13240.pdf

documents the local planning created from the guidance provided by the EAC protocol. The Clean Air Plan is designed to fulfill all requirements of the protocol.

The Clean Air Plan is designed to be a working document providing comprehensive planning for the ozone challenge faced by the citizens of the entire four-county San Antonio EAC region. Adoption of the final Clean Air Plan requires that control strategies, or methodologies for lowering ozone concentrations to acceptable levels, must be adopted. The technical analysis of the photochemical modeling used to demonstrate the effectiveness of the control strategies is performed by the staff of the Alamo Area Council Of Governments (AACOG) and is reviewed and approved by the Air Improvement Resources (AIR) Committees of AACOG, the TCEQ, and the EPA.

1.2 Planning Process

The AIR Executive Committee of AACOG is the planning committee for air quality under the Early Action Compact in the San Antonio region and is charged with oversight and coordination of the development of the Clean Air Plan for this region. The AIR Committees assess and report the region's progress at least every six months, with deliverables sent to TCEQ and the EPA. Public reporting of assessment and progress against milestone occurs at least once every six months during the regularly scheduled, meetings (scheduled on a monthly basis and open to the public) of the AIR Executive and AIR Advisory Committees of the AACOG.

Every meeting of the AIR Executive and Advisory Committees is a public meeting, with notification of the meeting time and location published by AACOG according to the Texas Open Meetings Act. AACOG provides notice of each meeting to the secretary of state, the county clerk of Bexar County, and posts notice in AACOG's main administrative offices in a place readily accessible to the general public at all times for at least 72 hours before the scheduled time of the meeting. (Although the AIR Executive and the AIR Advisory Committees are separate committees, they typically hold joint committee meetings at least once a month. In each case, the notification process is as described above.) The AIR Executive Committee's meetings satisfy the requirement in the EAC that planning meetings will be open to the public, with posted meeting times and locations.

The AIR Committee is pleased to engage with local citizens, the EPA and the TCEQ in the planning effort required to successfully develop a Clean Air Plan for the San Antonio EAC region. From the point of view of the AIR Committee, this Clean Air Plan is the culmination of years of effort and planning, which has been made possible through enabling funding provided by the Legislature of the State of Texas.

1.3 Biannual Report

As required by EAC guidance, areas that are participating in early voluntary 8-hour air quality plans must assess and report their progress in achieving EAC milestones in a regular, public process every six months. This document will fulfill the requirement for the second semi-annual progress report written for the San Antonio EAC.

The milestones in this report which are described in the EAC are:

- Completion & updates of emissions inventories as outlined in section b), Emissions Inventory;
- Completion & updates of modeling as outlined in section c), Modeling;
- Post-attainment demonstration and plan updates as outlined in section e), Maintenance for Growth;
- Continuing public involvement in the planning process will be conducted as outlined in section f), Public Involvement. This is in addition to the public reporting conducted at least once every six months, as outlined above;
- Identification and description of local control strategies under current **consideration** for inclusion into the area's local clean air plan, including those analyzed in modeling.

In addition, Lydia Wegman, Director of Air Quality Strategies and Standards Division of the US Environmental Protection Agency, signed a memo providing guidance on the content required in the biannual reports due in June and December of 2003. Through this memo, the EPA requires certain elements be incorporated into the report.[3] The reporting requirements given in both the EAC protocol and the Wegman memo have been organized in the following chapters of this report. These additional elements include:

- **Stakeholders: Roles and Responsibilities**

- **Evaluation and Selection of Emission Reduction Measures**
  A list of control measures still under consideration for adoption by the local area as part of the March 2004 submission;
  Likely implementation dates for the local control measures that are under consideration;
  Current assessment of the amount of emissions reductions expected to be achieved through implementation of the local control measures; and
  The geographical area in which each control measure is anticipated to apply.

[3] "Early Action Compacts (EACs): The June 16, 2003 Submission and Other Clarifications," Lydia N. Wegman, Director Air Quality Strategies and Standards Division, April 4, 2003. US Environmental Protection Agency, Research Triangle Park, NC 27711. Available online: http://www.epa.gov/ttn/naaqs/ozone/eac/6-16-2003_eac_milestone_memo.pdf

- **Public Outreach Activities**
  Continuing public involvement in the planning process will be conducted as outlined in section f), Public Involvement.

- **Update on Modeling and Technical Planning Activities**
  Post-attainment demonstration and plan updates as outlined in section e), Maintenance for Growth

Chapter 2 –Stakeholders: Roles and Responsibilities

2.1 Stakeholders

Stakeholders for the Clean Air Plan include local governments, businesses, industries, schools and citizens within the San Antonio EAC region. The AIR Committee enables area governments and industrial groups to participate in addressing air quality concerns. The AIR Committee is comprised of the Executive/Advisory, Technical, and Public Education Committees.

2.1.1 AIR Executive Committee

The AIR Committee makes recommendations regarding actions and policy to the local governments represented by the AIR Executive Committee membership. The AIR Executive Committee is the planning committee for air quality planning under the Early Action Compact in the San Antonio region.

The AIR Executive membership represents the major government organizations within the San Antonio Metropolitan Statistical Area (SA/MSA) as the SA/MSA was defined at the time the EAC was signed, December 9, 2002. Membership has been extended to similar local governments brought into the San Antonio Metropolitan Statistical Area through US Census redesignations of the SA/MSA boundary in 2003.

The AIR Executive Committee is comprised of local elected officials and representatives of major government organizations from the four counties of Bexar, Comal, Guadalupe and Wilson. County governments are represented by elected County Judge or County Commissioner and municipal governments are represented by an elected official serving as Mayor or City Councilperson. Other entities serving on the AIR Executive, as designated by the bylaws, have one representative on the committee. The following table lists agencies for AIR Executive memberships. [4]

Table 2.1 AIR Executive Member Agencies

Air Improvement Resources Executive Member Agencies	
Bexar County	City of San Antonio
Comal County	City of New Braunfels
Guadalupe County	City of Seguin
Wilson County	City of Floresville
Greater Bexar County Council of Cities	Alamo Area Council Of Governments
San Antonio / Bexar County Metropolitan Planning Organization	

[4] Bylaws, Air Improvement Resources Committee of the Alamo Area Council of Governments, available Dec. 4, 2003 online as: http://www.aacog.com/air/WhatWeDo/AIRCO Bylaws.htm

2.1.2 AIR Advisory Committee

The AIR Advisory Committee acts as a liaison between the AIR Executive Committee and public and private citizens. Membership of the AIR Advisory Committee includes the AIR Executive Committee. The committee is comprised of representatives from local governmental entities and industrial groups within the San Antonio MSA and includes representatives listed below.[5]

- Business representatives
- Environmental Groups
- Education agencies
- Transportation organizations
- Utilities
- Industry representatives
- Chambers of Commerce
- Health Organizations
- Neighborhood Organizations
- Other elected officials
- Minority Organizations

The following table lists the business, industry, and other groups from which the current members to the AIR Advisory Committee are drawn.

Table 2.2 AIR Advisory Membership

Air Improvement Resources Advisory Member Agencies	
HEB	TxDOT
Kendall County	Zachry Construction
S.A. Manufacturers Association	Word Construction Company
VIA Metropolitan Transit	Lackland Independent School District
Holt Company	City Of San Antonio
Neighborhood Associations	SAWS
Martin Marietta	New Braunfels Chamber of Commerce
City of Seguin	Guadalupe County
Valero	Texas State Inspection Association
USAA	Toyota Manufacturing of North America
American Lung Association	Greater San Antonio Chamber of Commerce
Northside Independent School District	

2.1.3 AIR Technical Committee

The AIR Technical Committee provides recommendations and technical assistance on air quality technical issues to the AIR Executive Committee. The members of the

[5] Ibid

committee are representatives of local planning agencies; those currently providing members to the committee are listed in the table provided.[6]

Table 2.3 AIR Technical Member Agencies

Air Improvement Resources Technical Committee Member Agencies	
Alamo Area Council of Governments	Metropolitan Planning Organization
Bexar County	City of New Braunfels
City Public Service	City of San Antonio
Comal County	City of Seguin
City of Floresville	Texas Commission on Environmental Quality (ex-officio)
Guadalupe County	TxDOT District Office
Metropolitan Health District	US Environmental Protection Agency (ex-officio)
VIA Metropolitan Transit	Wilson County
Texas State Inspection Association (ex-officio)	

2.1.4 AIR Public Education Committee

The AIR Public Education Committee provides stakeholders with the opportunity to participate monthly in the development of materials, advertisements, activities, and events aimed at educating the public about regional air quality issues and Clean Air Plan development.

2.1.5 Public Meetings/Clean Air Plan Workshops

In accordance with the EAC, the public will have opportunities to participate with the ongoing development of the Clean Air plan in order to familiarize themselves with the process and goals of the project. Although the regularly scheduled monthly meetings of the AIR Executive Committee, the planning committee for air quality planning under the Early Action Compact in the San Antonio region, are open to the public and always have a Citizens to Be Heard agenda item, additional exposure to the project is expressly provided to the public through these meetings. This is achieved through the hosting of Clean Air Plan Workshops. Information about the public meetings and workshops held during the second half of 2003 is given here.

Goals:

- Education - The public meetings and future workshops are designed to give the public background information and updates on topics such as air quality health issues, applicable federal and state law, current/historic ozone levels, the local response provided by the Early Action Compact. Other background may include an explanation of the EAC, the concept of control strategies, the

[6] Bylaws, Air Improvement Resources Committee of the Alamo Area Council of Governments.

current status of the plan, the role of local elected officials, of AACOG's committees, of the public, of the state and federal governments, timelines, deliverables under the EAC, etc.

- Communication of public opinion / feedback to the elected officials - Written comments and a synopsis of spoken comments will be provided to the elected officials in the AIR Committee.

Public Meeting/Workshop Design:

The public meetings and workshops had two basic components:

1) **Presentation by AACOG staff**
2) **Collection of responses and comments from the public**

Public Meeting/Workshop Schedule:

Table 2.4 Dates and Locations of Clean Air Plan Public Meetings/Workshops

Date	Location
July 16, 2003	AACOG Board Room, 8700 Tesoro, San Antonio, TX 78217
November 5, 2003	AACOG Board Room, 8700 Tesoro, San Antonio, TX 78217
November 18, 2003	AACOG Board Room, 8700 Tesoro, San Antonio, TX 78217

2.1.5.1 July Public Meeting

The public meeting on July 16, 2003 contained two segments, a question and answer session and a formal comment session. During the question and answer session, AACOG staff presented a power point presentation that provided various materials on issues regarding ground-level ozone. The material consisted of information on the causes of ozone formation, which organizations are currently involved on remedying the air quality situation, what political actions have occurred regarding the improvement of air quality, and strategies that have been voluntarily implemented to assist in the reduction of ozone precursors. Following the presentation, participating citizens were given the opportunity to ask questions or comment on issues or concerns pertaining to air quality planning and receive answers from AACOG staff.

A formal comment session followed the question and answer session. During the formal comment session, citizens voiced concerns regarding the region's air quality situation and the progress of planning to address the air quality problems. Answers to the questions were not given during this session, however written transcripts of the citizens' concerns were provided to elected officials.

2.1.5.2 November 5th: Clean Air for Central Texas: Meeting to Review Clean Air Strategies

A second public meeting/information session was held on November 5th. The purpose of the information session was to provide citizens an understanding of the region's air quality and the air quality planning process. A presentation was provided containing educational material regarding the air quality planning process. AACOG staff then provided answers from questions that had been previously asked by the public. Public citizens present at the meeting provided written questions and comments on the clean air strategies that were to be discussed at the information session and given a twelve-page document that provided descriptions of the clean air strategies to be modeled. A PowerPoint presentation by AACOG staff provided additional detail regarding the clean air strategies that were selected by the AIR Executive/Advisory Committees for initial photochemical modeling. The public was then invited to the ninth meeting of 2003 which was scheduled for November 18th. At this meeting, the public was able to comment directly to elected officials involved with the AIR Committee.

2.1.5.3 November 18th: Clean Air for Central Texas: Meeting to Receive Public Comments

The meeting held on November 18, 2003 enabled citizens to relay comments, questions, and concerns regarding San Antonio's Clean Air Plan and the air quality planning process. AACOG staff presented a presentation regarding planning processes, provided answers to previously asked questions, and distributed documents which provided in-depth descriptions of several clean air strategies under consideration. The public was able to comment directly to four elected officials who attended the meeting and are members of the AIR Committee.

2.2 Stakeholder Roles

Roles of the AIR Committee

The AIR Committee is composed of several committees: AIR Executive, AIR Advisory, AIR Technical, and AIR Public Education Committee. The mission of the AIR Committee is to facilitate the completion of the air quality studies, complete necessary planning activities, and develop a comprehensive emission reduction plan that will guide our region's actions to attain the 8-hour ozone NAAQS. This committee is also to engage and educate the public through numerous outreach activities.

Roles of the Public

Public participation is an integral part of the Clean Air Plan, thus various avenues must be provided to enable citizens to have access to the development process. Every citizen in the region has three avenues they can partake in: 1) AIR Committee public meetings, 2) public meetings and upcoming Clean Air Plan Workshops, and 3) responding to the AACOG website.

Chapter 3 – Early Action Compact Milestones

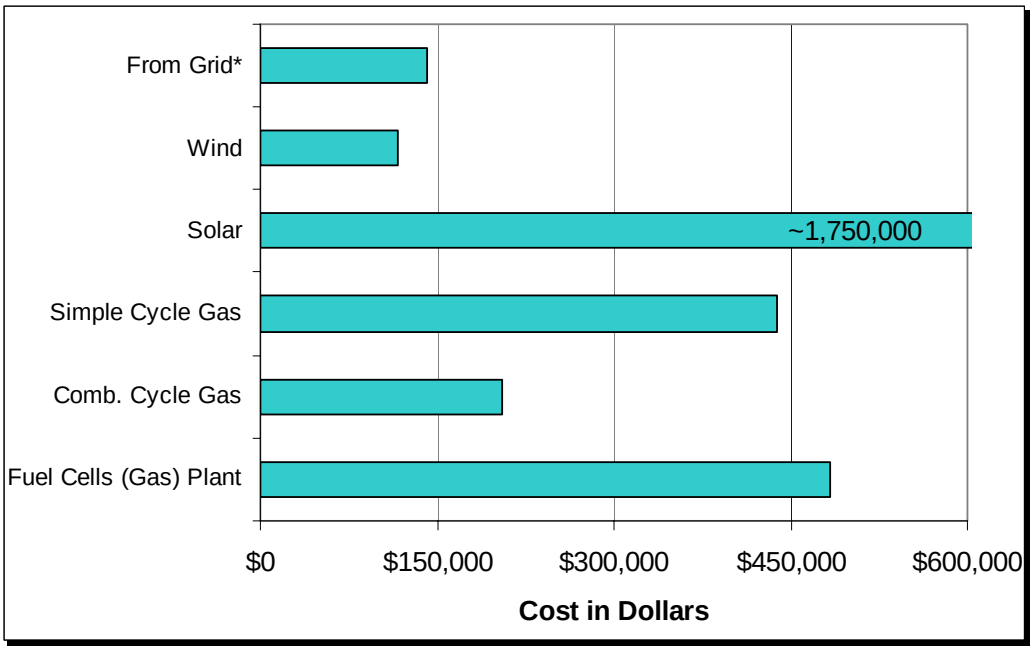
3.1 Control Strategy Development Milestones

The following sections describe some control strategies that were considered for their potential reduction of regional ground level ozone levels.

3.1.1 City Public Service Power Plant Control Strategies

Alternate power sources were evaluated for their effectiveness in reducing ozone precursor emissions by comparing their cost effectiveness to that of a currently proposed coal-fired plant that is scheduled to go online in 2009. This analysis, however, is not indicative of utilizing point source control strategies as this time. Figure 3.1 illustrates and compares the cost estimates of the alternate power sources. Solar power was the most expensive of all alternate power sources strategies, followed by fuel cells (gas) plant, and then combined cycle gas. Wind was the most cost effective of the strategies considered.

Figure 3.1 Cost Estimates for Implementation of Alternate Power Sources in the San Antonio EAC Region



3.1.2 Preliminary Control Strategy Modeling

Updated control strategies were presented to the Air Improvement Resources Technical Committee, which then advised the AIR Executive Committee to approve nine separate strategy and strategy combinations for modeling. The following strategies and strategy combinations were selected with consideration of the amount

of ozone precursors reduced as well as cost effectiveness, public & industry acceptance, and technical feasibility. At the time of this writing, the analysis of the ozone-reducing effectiveness of these strategies is ongoing.

These clean air strategies are currently receiving serious consideration in the San Antonio region and have been chosen for the initial modeling analysis now under way. At this time, it is not clear which strategies might be chosen for EAC / SIP implementation. Neither the date nor the region for implementation is certain, although the final implementation date required in the EAC of December 31, 2005 for all control strategies is a fixed milestone.

On-Road:

- Gasoline Sulfur, Reid Vapor Pressure (RVP) 7.2, and Stage I
- Gasoline Sulfur, RVP 7.2, OBDII and Stage I
- RVP 7.2, OBDII and Stage I
- Acceleration Simulation Mode (ASM) with OBDII
- On Board Diagnostics II (OBD II)
- Two Speed Idle (TSI) with OBDII

The gasoline sulfur strategy would require reductions in sulfur levels to a maximum level of 30 parts per million (ppm) and an average level of 15 ppm. This would be a greater reduction than and acting in advance of the EPA rule for a 2005 refinery average[7] for gasoline sulfur content set at 30 ppm, with a corporate average of 90 ppm and a cap of 300 ppm.

The RVP strategy would lower the Reid Vapor pressure from its current ozone season level of 7.8 to 7.2 pounds per square inch.

The Stage I program would require use of Stage I Vapor Recovery systems in gasoline stations having a throughput of 50,000 to 125,000 gallons/month. State law currently requires such equipment to be in place for stations with a throughput greater than 125,000 gallons/month.

The ASM with OBD II strategy is currently the core of the Texas state Vehicle Emissions Testing Program.[8]

Area:

- Solvent Based Degreasing Standards
- Equipment Based Degreasing Standards
- Municipal Compliance with International Energy Conservation Code

[7] EPA Fact Sheet: "EPA's Program for Cleaner Vehicles and Cleaner Gasoline" (EPA420-F-99-051, December 1999), online: http://www.epa.gov/otaq/regs/ld-hwy/tier-2/frm/f99051.pdf

[8] More information on the Acceleration Simulation Mode, On Board Diagnostics II, and Two Speed Idle vehicle emission tests operated by Texas is available through the AirCheck Texas program from the Texas Department of Public Safety, online at http://www.txdps.state.tx.us/vi/

Generally, the Solvent based degreasing standard would require lower VOC content. Specifically, the work practice requirements and other standards would be similar to those in the SCAQMD Rule 1122.[9]
The Equipment based degreasing standard would be similar or identical to that of Title 30, Part I, Chapter 115, Subchapter E of the Texas Administrative Code.[10]
Emissions reductions available through the Municipal Compliance with International Energy Conservation Code program are based on compliance with the Energy Efficiency sections of Texas Senate Bill 5.[11] A draft guide addressing SIP credit for Energy Efficiency projects was issued for comment on December 3 by the TCEQ.[12]

3.1.3 Cost/Ton Evaluation for VOC + NOx Emissions

The following figures illustrate the cost for implementation of the control strategies that will be modeled for analysis. Figure 3.2 graphically depicts the cost per ton of selected on-road, area, and non-road control strategies. The costs for each control strategy and strategy combination are given in the following paragraphs as well as in table 3.1.

On road strategies are compared on an individual basis and in various combinations.

Of the individual control strategies, RVP 7.0 proved to be the most cost efficient by costing approximately $3,305 per ton of VOC. ASM with OBDII had the highest cost of implementation with an estimation of $10,620 per ton of VOC and NOx. The most cost effective strategy combination was the combination of RVP 7.2, lower gasoline sulfur, and stage I implementation. The combination of ASM, OBD II, and RVP 7.0 cost the most with an estimated cost of $9,072 per ton of VOC and NOx..

The wood furniture strategy requires the use of reformulated low-VOC solvents and is estimated at $10,000 per ton of VOC. The control strategy for degreasing evaluates the use of a solvent based degreasers that emit 95% less VOCs than before and is estimated to cost $1,400 per ton VOC. Stage I vapor recovery is estimated at $2,894 per ton of VOC.

Note that the Emission Reduction and Cost Estimate figures here are draft estimates, based on implementation in the four-county San Antonio EAC region. At this time, it is not clear which strategies might be chosen for EAC /

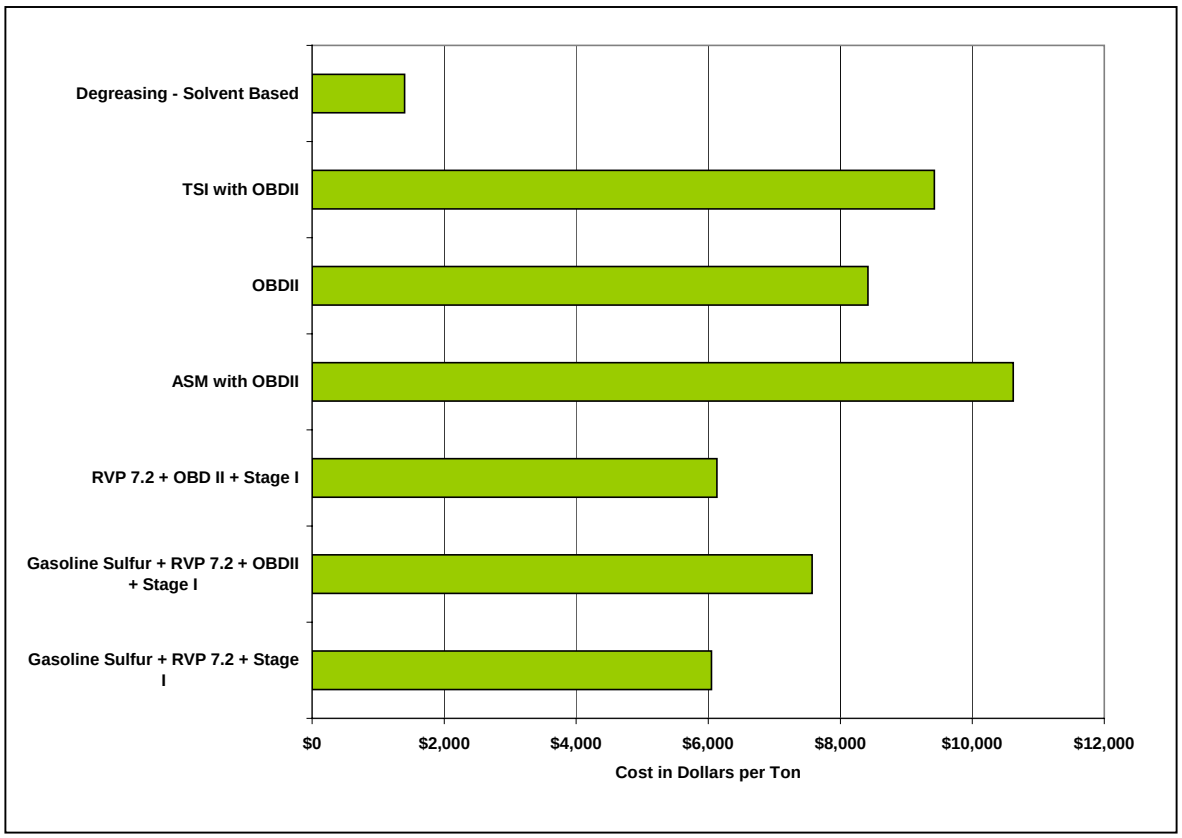
[9] South Coast Air Quality Management District, Regulation XI, Source Specific Standards, Rule 1122, Solvent Degreasers, online as http://www.aqmd.gov/rules/doc/r1122.doc
[10] Available online through http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC
[11] For more information, visit the Texas Emissions Reduction Plan / SB5 website of the TCEQ: http://www.tnrcc.state.tx.us/oprd/sips/overview.html - energy
[12] Contact Eve Hou of TCEQ (ehou@tceq.state.tx.us) for a copy of "Incorporating Energy Efficiency/Renewable Energy (EE/RE) Projects into the SIP - A Guide for Local Entities."

SIP implementation. Neither the date nor the region for implementation is certain, although the final implementation date required in the EAC of December 31, 2005 for all control strategies is a fixed milestone.

Table 3.1 2007 Emission Reduction Cost Analysis for SA EAC Region

Control Strategy	Cost/Ton
Gasoline Sulfur + RVP 7.2 + Stage I (50,000 gal.)	$6,286
Gasoline Sulfur + RVP 7.2 + OBD II + Stage I (50,000 gal.)	$7,677
RVP 7.2 + OBD II + Stage I (50,000 gal.)	$6,241
ASM with OBD II	$10,620
OBD II	$8,419
TSI with OBD II	$9,425
Degreasing - Solvent Based	$1,400

Figure 3.2 Cost per Ton Analysis of On Road and Area Control Strategies



Note: International Energy Conservation Codes and Degreasing – Equipment Based were not included in figure 3.2 due to the unavailability of a cost estimate.

3.2 Public Involvement Milestones

Educating the public about the importance of the region's air quality continues to be a crucial effort for this Clean Air Plan. Outreach and education efforts continue within the MSA, often through partnerships with other governmental entities and industrial leaders in the area. As the Clean Air Plan is developed, citizens and citizen groups are given the opportunity to be involved in the Clean Air Plan development process.

3.2.1 Media

Local media efforts have played an important role in notifying the public about the development of the Clean Air Plan as well as in educating the public on the state of the region's air quality and how air quality affects respiratory health. Television, radio, newspapers, and websites have been avenues through which information about the Clean Air Plan and the four county's air quality has been dispersed. A second local air quality issues outreach survey is currently being performed. The results of this survey will inform outreach staff about the success of previous efforts and will inform the decision-making process regarding the Comprehensive Communications Plan. Press releases and public service announcements have been and will continue to be utilized to educate the public. Between June and November 2003, there were 14 television pieces, 18 radio pieces, and 34 newspaper pieces regarding the Clean Air Plan and air quality issues. During this time, public service announcements are confirmed to have aired on four television stations (WOAI, KABB, KRRT, and News9 San Antonio) and nine radio stations (KISS, KSMG, KKYX/KCYY, WOAI, KAJA, KXTN, KROM, and KONO)

3.2.2 Public Meetings

As stipulated in the Texas Open Meetings Act, the AIR Committee meetings are open for public participation. Monthly public workshops and/or meetings have also been held to update the public on the progress of the Clean Air Plan as well as gather comments and questions from the public. Between June and November 2003, four such meetings/workshops were held at the Alamo Area Council of Governments.

3.2.3 Other Outreach Efforts

Non-media related outreach efforts continue. Between June and November 2003, 18 governmental, business, and/or civic group presentations have been provided. In the same time period, AACOG staff provided presentations to 12 area schools, reaching more than 2,500 students. Whenever possible, AACOG coordinates and/or participates in public events; such events allow AACOG staff to educate citizens on how everyday actions contribute to air pollution and that alternate methods of doing the same tasks can help reduce emissions. During this time period, AACOG participated in ten events. Additionally, AACOG maintains an air quality website, which is updated weekly and provides a wealth of information on air quality issues.

In addition, the AACOG staff is vigorously promoting the Texas Emissions Reduction Plan (TERP) created in 2001 by Texas Senate Bill 5. With the partnership of the Texas Commission on Environmental Quality and a number of stakeholders, AACOG hosted a TERP workshop on November 13, 2003. Over 130 attendees learned about the TERP grant funds to upgrade diesel trucks and equipment. AACOG is currently planning another workshop in early 2004 which will provide direct, hands-on guidance in filling out the grant application forms for TERP projects.[13] AACOG has also hosted a series of workshops for local governments, citizens, and homebuilders on the energy efficiency aspects of Senate Bill 5 as well.

3.3 Emissions Inventory Milestones

Updates to modeling and technical projects necessary for proper development of the Clean Air Plan must be reported in order to successfully achieve set milestones. There are several key elements necessary to contribute to the success of the Clean Air Plan.

3.3.1 Emissions Trend Analysis

The *Emissions Trend Analysis* is one of many steps set by the Early Action Compact to demonstrate maintenance of the 8-hr ozone standard through analysis of past to current emissions trends with projected growth. The analysis addresses emissions growth through the year 2012 to ensure the area of study, the San Antonio EAC region, will maintain attainment according to the 8-hr average ozone National Ambient Air Quality Standard (NAAQS) during that period.

The report focuses on Volatile Organic Compounds (VOC) and Nitric Oxides (NOx) for Non Road, Area, Biogenic, Point, and On Road Sources. In accordance with the EAC, the report explores the following topics:

- Analysis of emissions growth
- Reduction measures
- Continuing the planning process
- Suggestions and recommendations
- Biannual Review of growth

The Emission Trend Analysis was completed and submitted to TCEQ and the EPA by September 30, 2003.

[13] Visit http://www.tnrcc.state.tx.us/oprd/sips/terp.html for more information on the TCEQ's TERP program. For more information on AACOG's TERP workshops, please visit http://www.aacog.com/terp/.

3.4 Modeling Milestones

The Early Action Compact requires that control strategy analysis be based on SIP quality modeling episodes that perform within EPA's acceptance criteria. The base case and future case models were required to be developed by October 30, 2003. The future case will be used to evaluate control strategies. The proceeding sections describe the photochemical model in greater detail.

3.4.1 September 1999 Photochemical Model

In the Spring of 2002, ENVIRON International Corporation completed the development of a meteorology and photochemical model simulation for South-central Texas that included four near non-attainment areas (NNAs): Austin, Corpus Christi, San Antonio, and Victoria. The simulation spanned a multi-day period of September 1999 in which air-monitoring stations at each of the four NNAs consistently recorded high ambient ozone concentrations.

3.4.1.1 Quality Assurance of the 1999 Simulation

Various sensitivity analyses were performed in an effort to observe adequate model performance. One such analysis involved testing the model's sensitivity by altering its parameters. These alterations are described in the following paragraphs.

Dry Deposition

Incorporating dry deposition into the photochemical model is one way of testing environmental effects on ozone levels. When a drought occurs, stomatal openings of vegetation start to close and do not remove pollutants as they would during ideal weather conditions.

Boundary Conditions

EPA guidance suggests setting ozone concentrations at 40 ppb along the boundaries of the modeling domain[14] in order to determine the impact of boundary conditions on the model's ability to replicate ozone concentrations in the San Antonio region and the table below lists modifications made to the boundary conditions. The results indicated sensitivity in ozone concentrations during the September 1999 episode from modifications along the northern and eastern borders of the 36-km domain, but insensitive to changes along the western boundary.

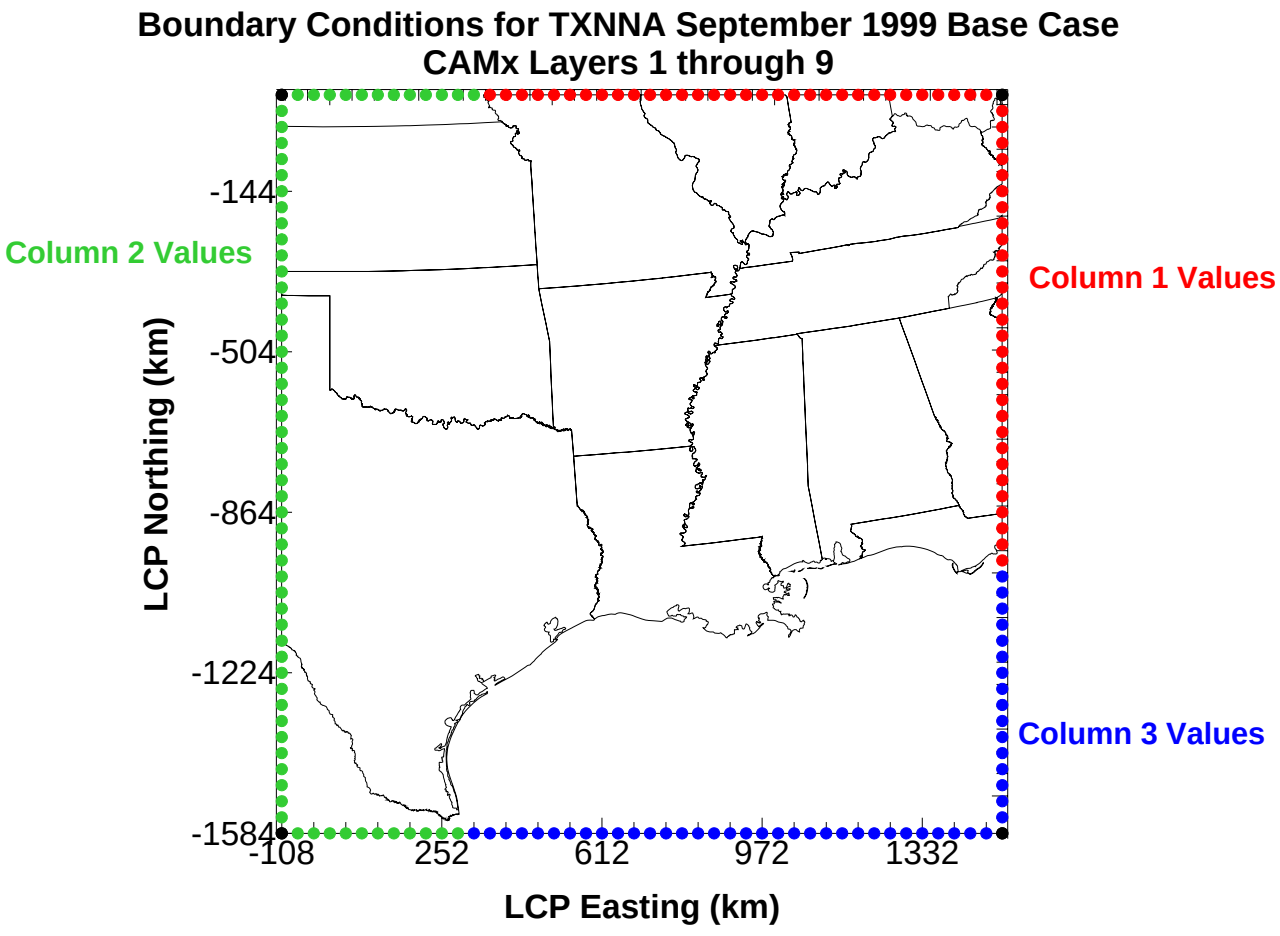
[14] U.S. Environmental Protection Agency. Guideline for Regulatory Application of the Urban Airshed Model, EPA-450/4-91-013. Research Triangle Park, NC. July 1991. Available online through EPA's SCRAM site: http://www.epa.gov/scram001/tt25.htm - guidance. Click on UAMIVGUIDE hotlink.

Table 3.2 Ozone Concentrations used for Boundary Condition Sensitivity Evaluation Runs

Sensitivity Run	Ozone Concentration in PPB			
	North Boundary	East Boundary	South Boundary	West Boundary
#1	60	60	60	60
#2	60	60	40	40
#3	60	40	40	40
#4	40	60	40	40

The 36-km grid boundary was divided into three areas based on modifications that influenced predicted ozone levels in San Antonio. From highest to lowest sensitivity, the three levels were: (1) northeastern boundary, (2) the southeastern and southern boundaries, and (3) the southwestern, western, and northwestern boundaries, as shown in figure 3.3.

Figure 3.3 Divisions of 36-km Grid Boundaries Based on Level of Sensitivity to Ozone Concentration Modifications.



Precursor concentrations along the three boundary divisions were also analyzed. Ozone concentrations for the entire 36-km boundary were set at 40 ppb.

Table 3.2 provides the precursor concentrations developed from the Southern Oxidants Study (SOS) and used for each of the three boundary divisions during the final sensitivity run as well as EPA-recommended settings for each precursor species, when available, for comparison purposes. Results reflected improved predictions of ozone in the Central Texas region when the listed precursor concentrations were used in the photochemical model's 36-km boundary and SOS boundary conditions tended to mitigate the ozone under-predictions of the model. Since the SOS measurements improved model performance, and further, are technically justifiable, analysts concluded that the SOS values should be used as boundary conditions for development of the 1999 Central Texas base case.

Table 3.3 Precursor Concentrations used in the Final Sensitivity Run of the Photochemical Model

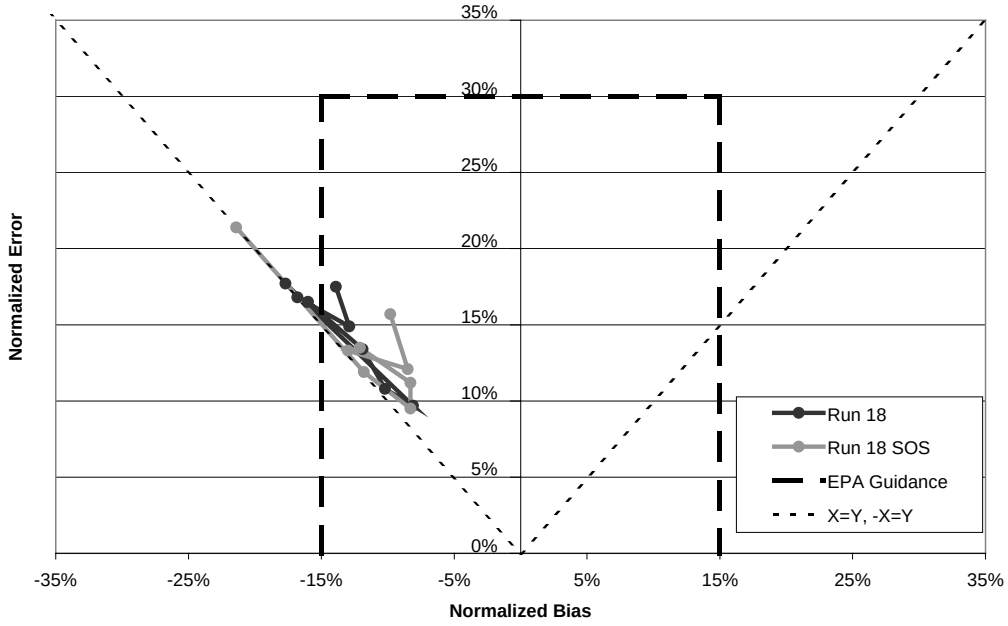
Species	Column 1 Northeast	Column 2 West	Column 3 Southeast	EPA Defaults
O3	40	40	40	40
CO	200	200	100	100
NO	0.1	0.1	0.1	0.000049
NO2	1	1	1	0.08555
HNO3	3	3	1	1.525
HNO2	0.001	0.001	0.001	0.000728
ALD2	0.555	0.555	0.05	0.1051
ETH	0.51	0.51	0.15	0.005315
HCHO	2.1	2.1	0.05	1.068
OLE	0.3	0.3	0.05	
PAR	14.9	14.9	7.6	3.078
TOL	0.18	0.18	0.0786	0.006043
XYL	0.0975	0.0975	0.0688	
ISOP	3.6	0.1	0.001	
PAN	0.1	0.1	0.1	0.03834
H2O2	3	3	1	2.263
MEOH	8.5	0.001	0.001	
ETOH	1.1	0.001	0.001	

Performance statistics

Figure 3.4 presents the normalized bias and normalized error of Run 18 SOS, which was the best performing model run with ozone levels within EPA recommended performance standards. Normalized bias was determined by figuring the percent difference between the observed and simulated values divided by the observed value matched by hour and site. Normalized error was determined by figuring the percent absolute value of the

difference between the observed and simulated values divided by the observed value matched by hour and site.[15] Initial boundary conditions for the North, South, East, and West boundaries were set at 60 ppb for Run 18.

Figure 3.4 Normalized Error and Normalized Bias for AACOG Model Performance Evaluation for Central Texas Region, Sept. 13-20, 1999



Figures 3.5 and 3.6 compare the differences between predicted and observed ozone values for the September 1999 episode at CAMS 23 and CAMS 58 respectively. Both figures indicate sufficient model performance in predicting ozone values close to what was observed. The minimum and maximum range was base on a 3 x 3 grid area of the 4-km grid.

[15] See "OTAG Technical Supporting Document, Chapter 2 - Regional and Urban Scale Modeling," http://www.epa.gov/ttnnaaqs/ozone/rto/otag/finalrpt/chp2/finalf.htm

Figure 3.5 Predicted vs Observed Hourly Ozone Values for Run 18 SOS at CAMS 23 for the September 1999 Episode

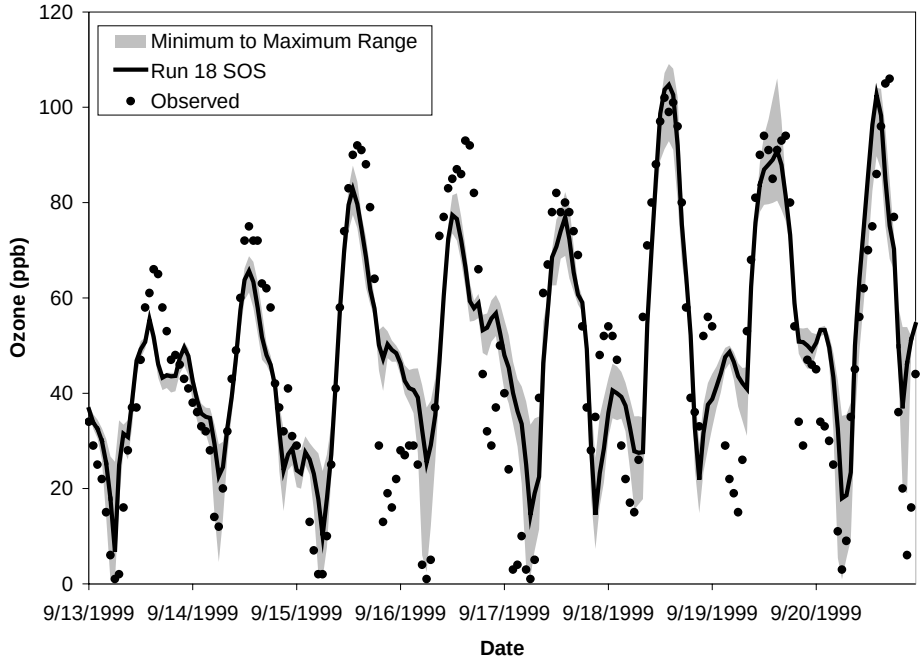
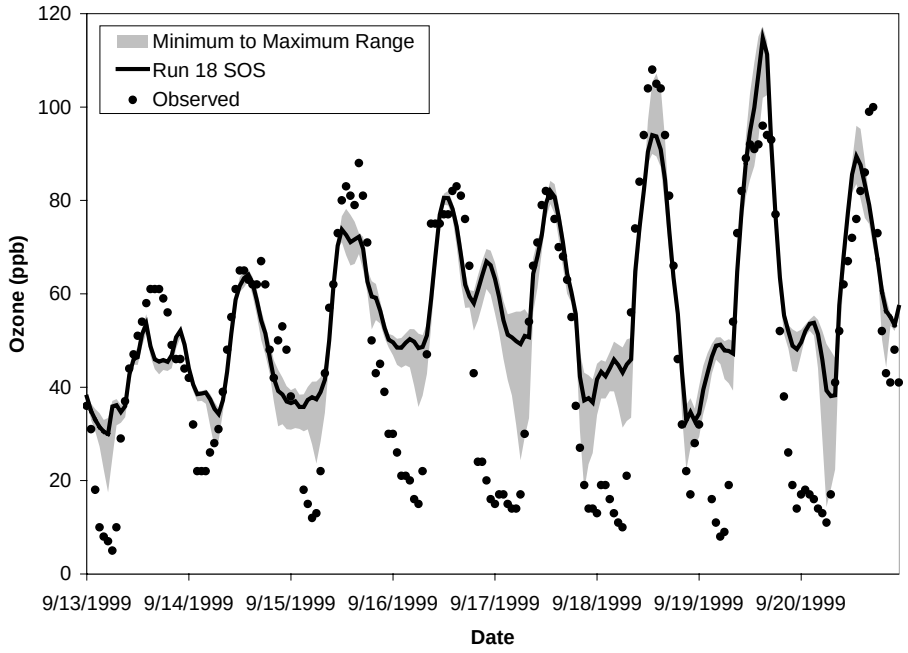


Figure 3.6 Predicted vs Observed Hourly Ozone Values for Run 18 SOS at CAMS 58 for the September 1999 Episode



Figures 3.7 through 3.8 provide illustrated depictions of the changes in anthropogenic emissions from September 1999 to September 2007. Decreases in emissions in Bexar

County can be noted, especially within the metropolitan area of San Antonio. Increases can be observed in southern Bexar County, which is where the Toyota manufacturing plant is planned to be located. Figures 3.8 and 3.9 depict the ground-level NOx emissions over the modeling domain. As anticipated, the highest levels of NOx can be observed in the metropolitan areas of San Antonio and Austin. Figures 3.10 and 3.11 illustrate changes in ozone levels on September 19th and September 20th respectively. Ozone levels on figure 3.10 are decreasing over the San Antonio region for the most part. On September 20th, decreases in ozone levels can be noted throughout the region as well, except for parts of southern Bexar County. This can be attributed to less NOx scavenging at the CPS power plant because of lower NOx emissions.

Figure 3.7 Changes in anthropogenic NOx emissions between 1999 and 2007, September 20, 2007

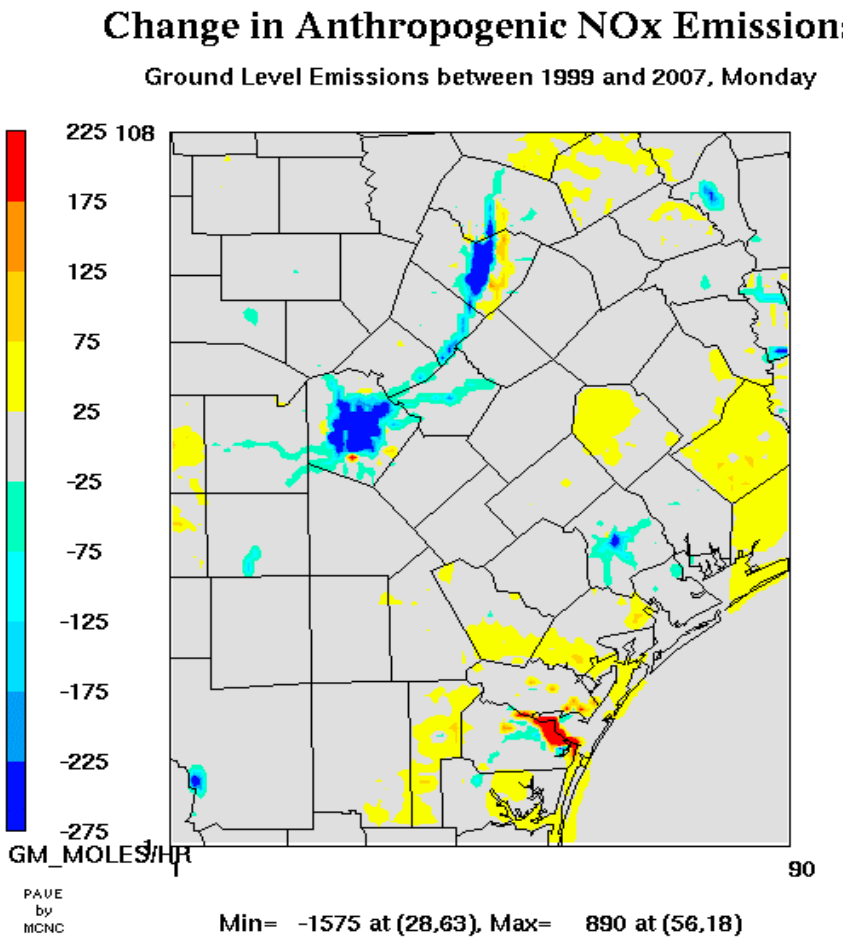


Figure 3.8 Changes in anthropogenic VOC emissions, between 1999 and 2007, September 20, 2007

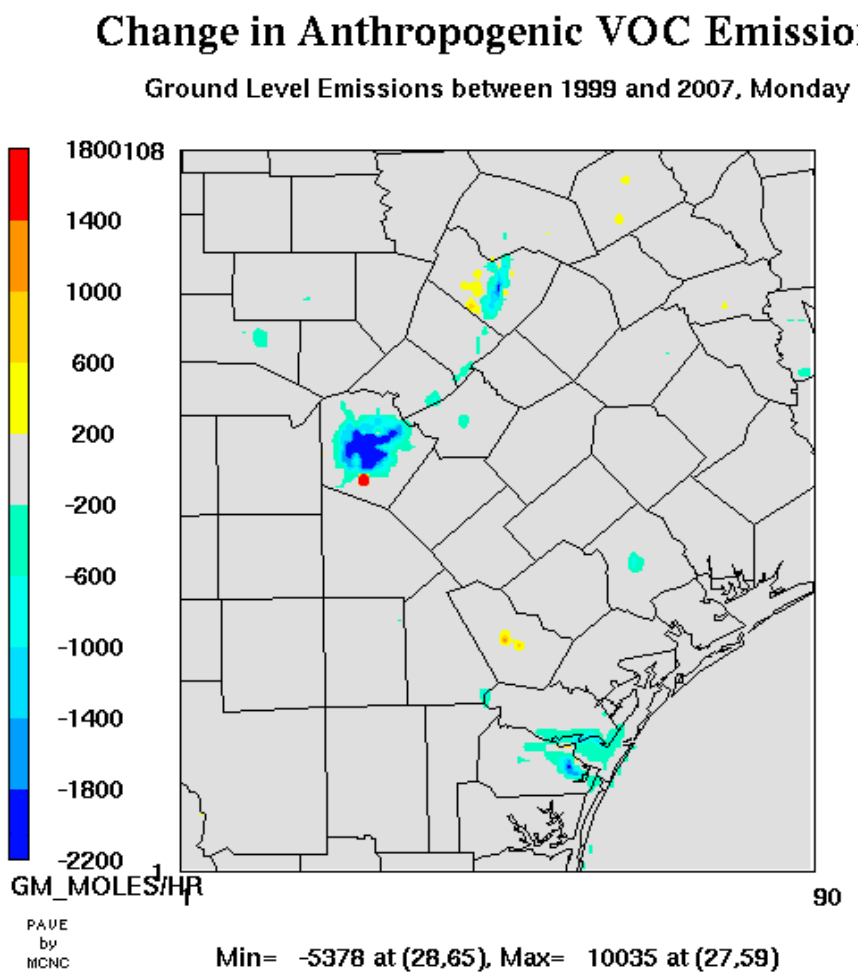


Figure 3.9 Anthropogenic VOC Emissions for September 20, 2007

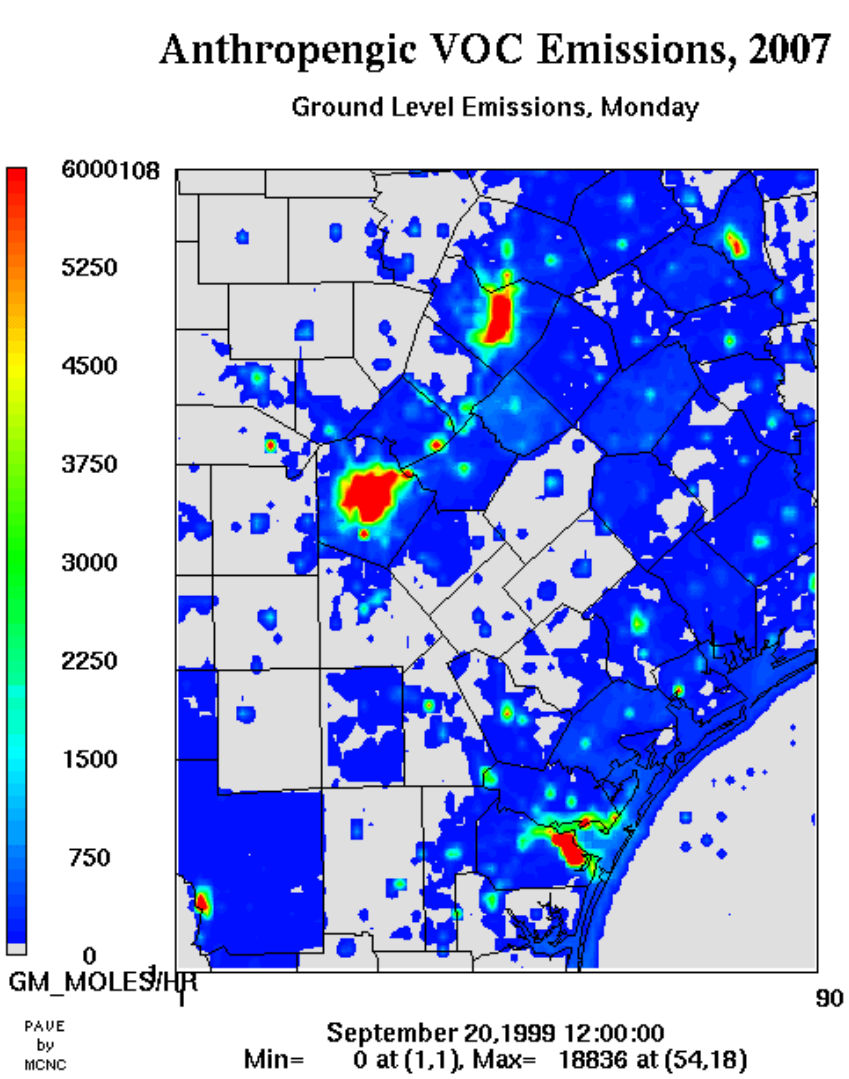


Figure 3.10 Anthropogenic NOx Emissions for September 20, 2007

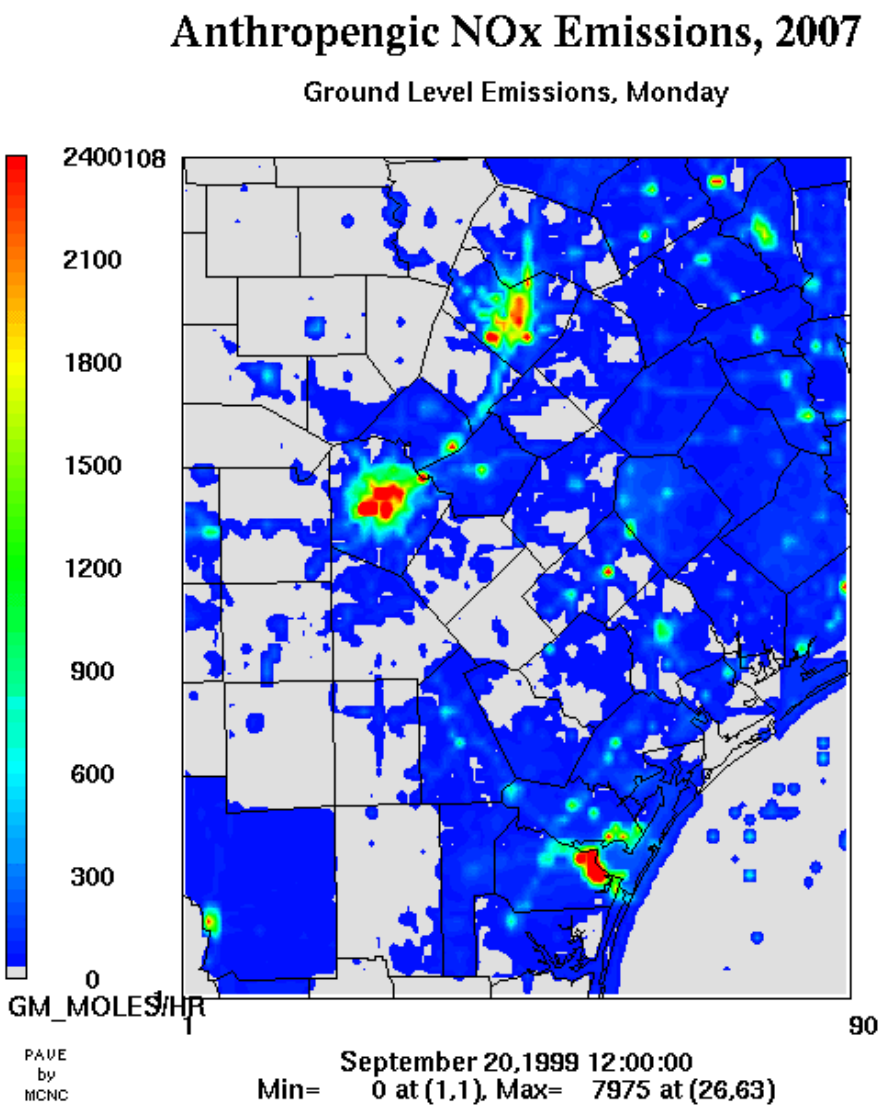


Figure 3.11 Change in Ground Level Ozone for Sunday, September 19th between 1999 and 2007

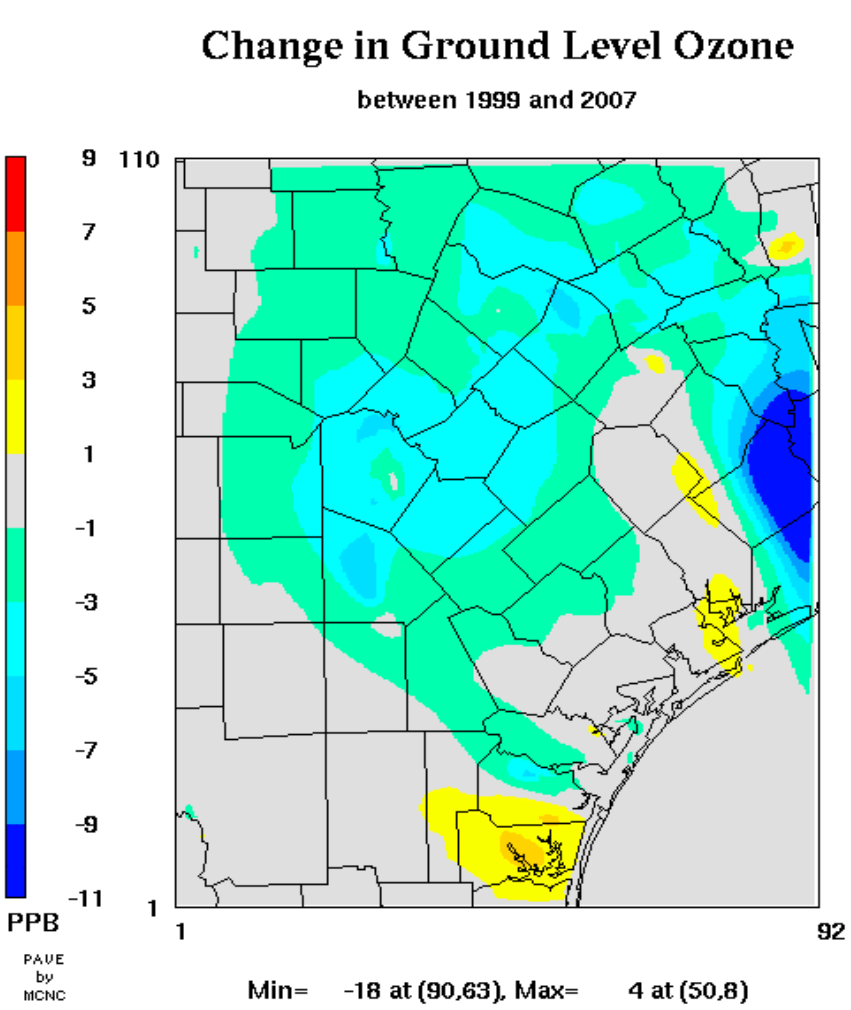
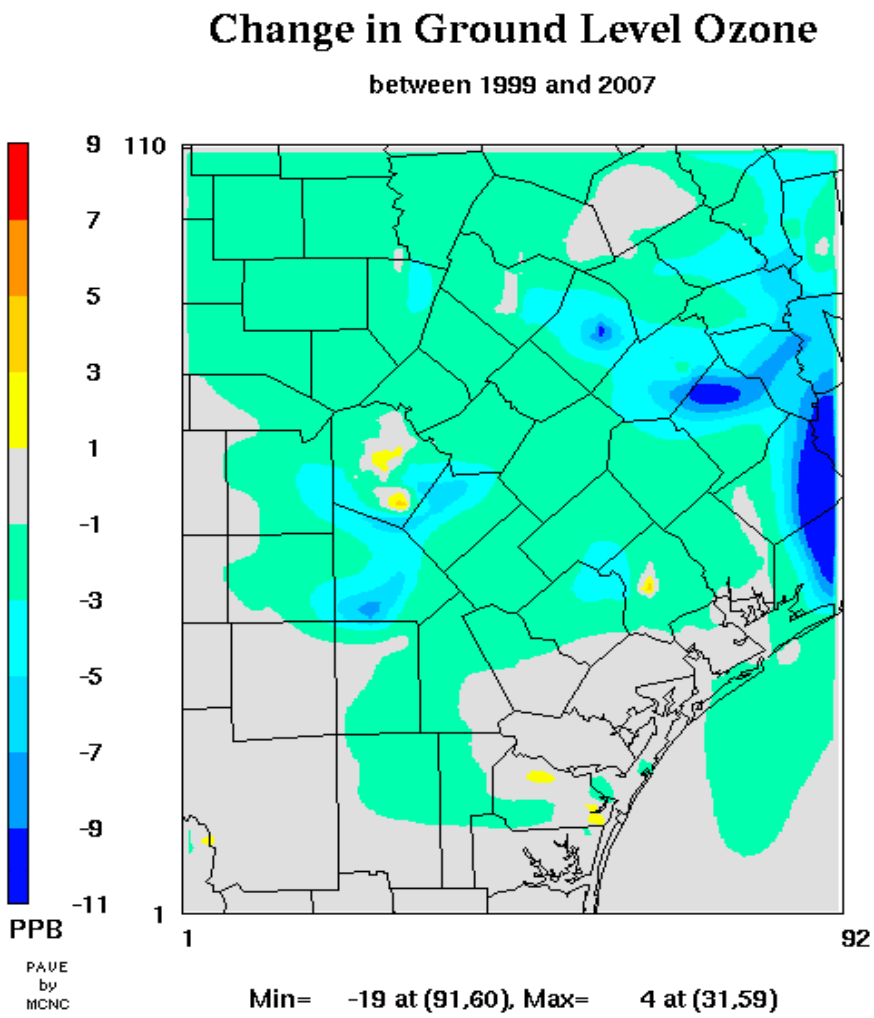


Figure 3.12 Change in Ground Level Ozone for Monday, September 20th between 1999 and 2007



3.4.2 Update of Photochemical Model Emission Inventory with Updated MOBILE6

The Texas Transportation Institute provided AACOG with updated on-road emission estimates developed with the latest version MOBILE6. These emissions were then incorporated into the model's emission inventory to reflect updated emission estimates. The following tables list the VOC and NOx emissions for each day of the modeling episode. The updated MOBILE6 figures were incorporated in the mobile source category.

Table 3.4 VOC emissions for the September 1999 photochemical model with MOBILE6 updates

	Mobile	Point	Area	Non-Road	Total
13-Sep	88.4	8.2	93.8	43.5	233.9
14-Sep	88.1	8.1	93.8	43.5	233.4
15-Sep	88.8	7.9	93.8	43.5	234.0
16-Sep	89.4	8.0	93.8	43.5	234.7
17-Sep	93.1	8.4	93.8	43.5	238.7
18-Sep	60.2	7.7	72.5	53.0	193.4
19-Sep	48.5	7.7	42.5	52.8	151.5
20-Sep	95.3	7.9	93.8	43.5	240.5

Table 3.5 NOx emissions for the September 1999 photochemical model with MOBILE6 updates

	Mobile	Point	Area	Non-Road	Total
13-Sep	141.1	113.9	6.7	44.8	306.5
14-Sep	142.2	104.4	6.7	44.8	298.1
15-Sep	143.6	101.1	6.7	44.8	296.2
16-Sep	147.9	101.8	6.7	44.8	301.1
17-Sep	135.8	114.8	6.7	44.8	302.0
18-Sep	83.4	99.1	6.1	23.8	212.4
19-Sep	59.5	93.6	5.6	23.0	181.7
20-Sep	145.8	101.3	6.7	44.8	298.5

Table 3.6 VOC Emissions for the September 2007 Photochemical Model Projection with MOBILE6 Updates

	Mobile	Point	Area	Non-Road	Total
Day 1	50.4	12.5	98.8	31.0	192.6
Day 2	50.3	12.5	98.8	31.0	192.6
Day 3	50.7	12.5	98.8	31.0	192.9
Day 4	51.1	12.5	98.8	31.0	193.4
Day 5	52.2	12.5	98.8	31.0	194.5
Day 6	33.5	7.1	74.5	35.2	150.4
Day 7	26.9	6.6	40.2	35.1	108.8
Day 8	53.7	12.5	98.8	31.0	195.9

Table 3.7 NOx Emissions for the September 2007 Photochemical Model Projection with MOBILE6 Updates

	Mobile	Point	Area	Non-Road	Total
Day 1	80.8	73.5	7.0	45.0	206.3
Day 2	81.5	73.5	7.0	45.0	207.0
Day 3	82.3	73.5	7.0	45.0	207.8
Day 4	85.0	73.5	7.0	45.0	210.5
Day 5	78.9	73.5	7.0	45.0	204.4
Day 6	49.7	73.0	6.5	26.0	155.1
Day 7	36.2	73.0	5.9	25.2	140.3
Day 8	84.0	73.5	7.0	45.0	209.5

The following figures (3.13-3.16) graphically compare the total emission estimates for each of the modeling days with emissions separated by source category. By observing the graphs, VOC emissions decrease in mobile and non-road sources from 1999 to 2007. A decreasing trend can also be noted in NOx emissions from point and mobile sources. Area and point source VOC emissions are projected to increase by 2007 while non-road NOx emissions are also projected to increase slightly.

Figure 3.13 Total VOC Emissions per Source Category in the September 1999 Photochemical Model

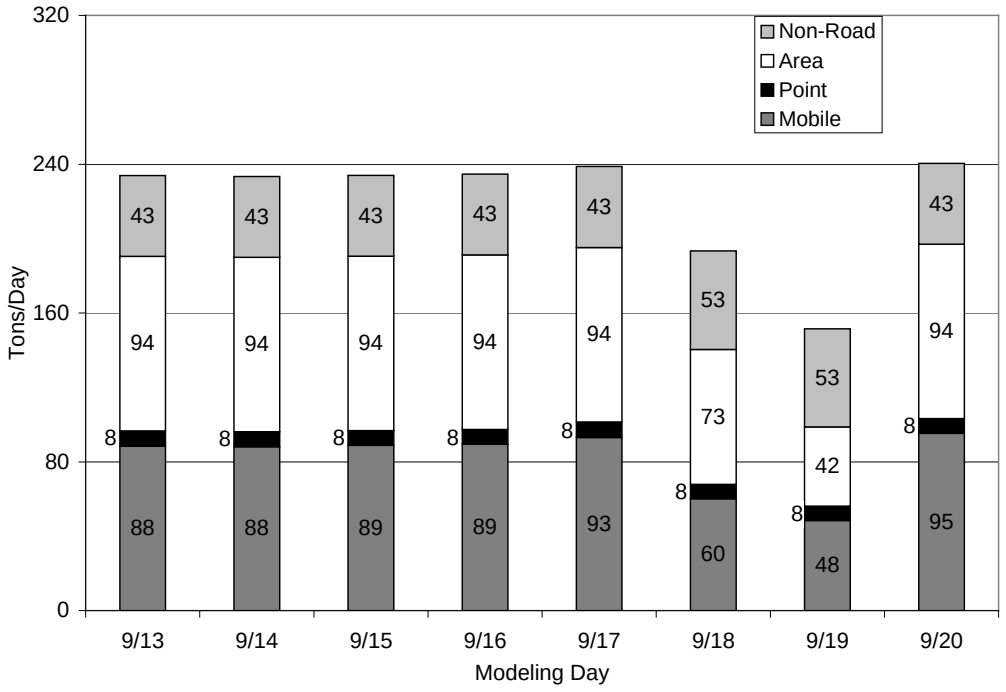


Figure 3.14 Total NOx Emissions per Source Category in the September 1999 Photochemical Model

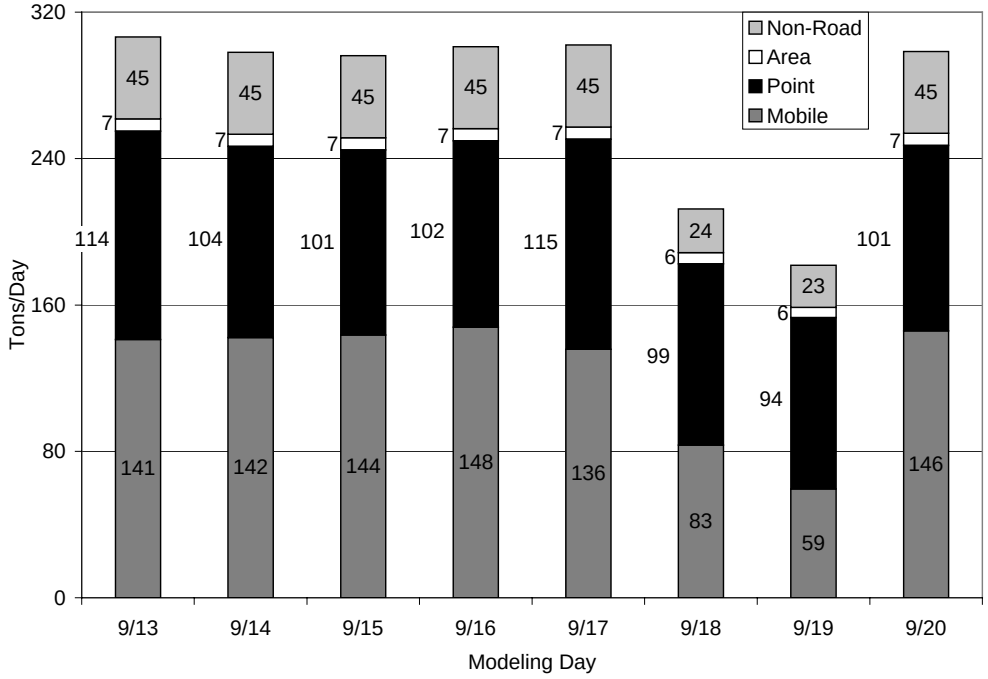


Figure 3.15 Total VOC Emissions per Source Category in the September 2007 Projection

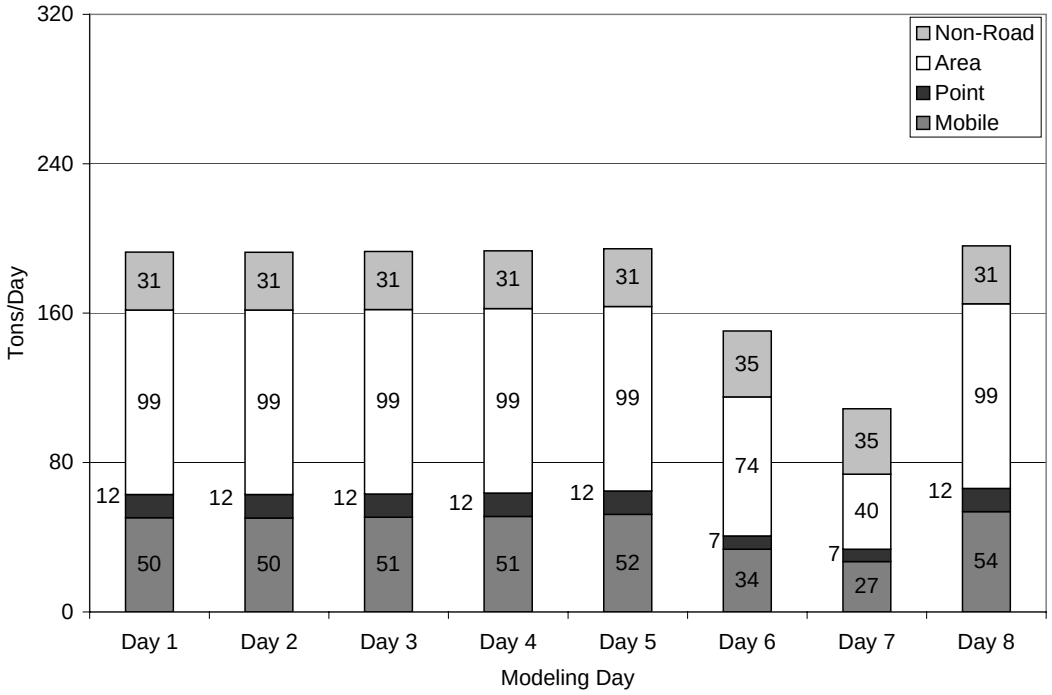
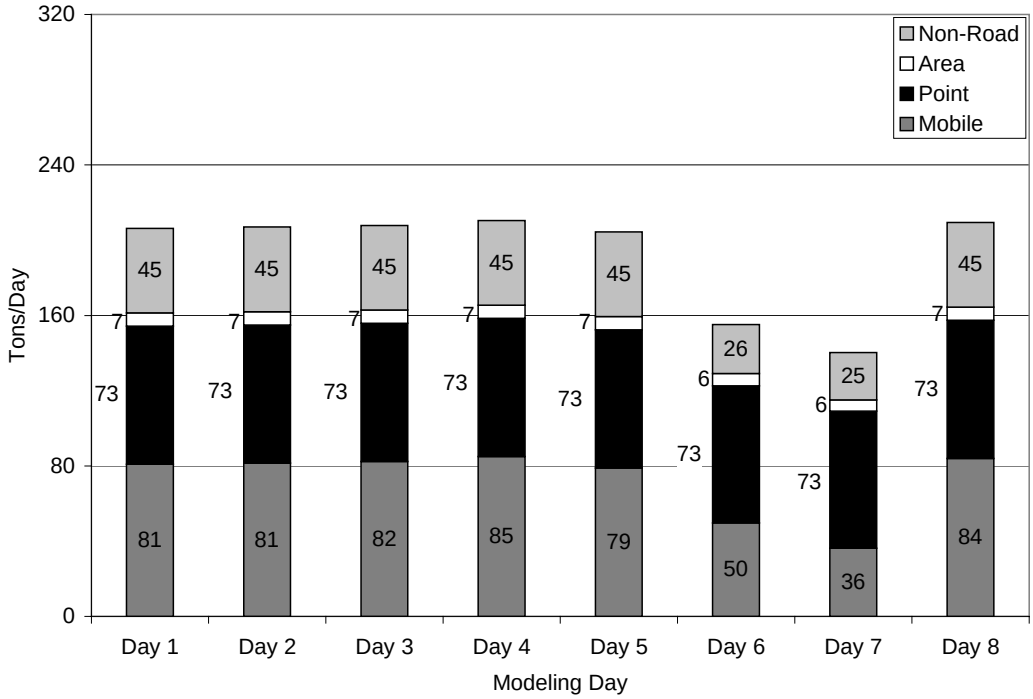


Figure 3.16 Total NOx Emissions per Source Category in the September 2007 Projection



3.4.3 Development of the 2007 Projection

A 2007 projection was developed from the September 1999 episode in order to evaluate the effectiveness of the potential clean air strategies on the region's air quality. For the projection, model parameters such as meteorology were left unaltered however emission estimates were projected from 1999 to 2007. Area sources were projected by using adjustment factors provided by the Economic Growth Analysis System (EGAS) model and population projections provided by the Texas Water Development Board. Mobile source emissions were projected using the MOBILE6 model and non-road sources were projected using the latest version of the NONROAD model, except for railroad emissions, which were projected using an EPA approved methodology. Some point source emissions were provided by the TCEQ, City Public Service (CPS) power plant emissions were provided by CPS, and automobile manufacturing emissions were provided by Toyota Manufacturing of North America. Airport/Military source emissions and biogenic emissions were the only sources not projected for 2007 and remained unchanged. Also the model takes into account the use of stage I vapor recovery, ORVR, and state/federal mandated control strategies.

3.4.4 2007 Regional Emission Inventory

The 1999 regional EI encompasses several states in the eastern part of the United States but are within the 36-km modeling domain of the model. Emissions from area, mobile, point, and nonroad sources for each state were gathered from the National Emission Inventory (NEI) 1999 Version I for Criteria Pollutants. Biogenic emissions were prepared using version 2.2 of the Global Biosphere Emissions and Interactions System (GLoBEIS).[16] The 2007 projection was provided by TCEQ and included the NOx SIP Call rules, area, nonroad, mobile, EGUs, and NEGUs.

3.4.5 Updated Capital Area Planning Council Emission Inventory (EI) incorporated into the Photochemical Model

The Capital Area Planning Council provided AACOG with updated emission inventory figures to be incorporated into the photochemical model. The September modeling episode will be the photochemical model used for development of the State Implementation Plan for both deferred nonattainment areas. Refinements of the CAPCO 1999 EI concluded that anthropogenic emissions were greatest in Travis County, which contains the city of Austin. On-road mobile sources are the largest contributors of NOx by contributing nearly 60% of total anthropogenic NOx emissions in the five-county Austin EAC region.

[16] Jimenez, M. et al. "Emissions Processing for the Joint CAMx Photochemical Modeling of Four Southern Texas Near Non-Attainment Areas." ENVIRON International Corporation, August 6, 2002.

Point sources are the second largest NOx polluter by contributing approximately 20% of total NOx emissions. Anthropogenic VOC emissions in the five-county area are mainly emitted by area sources and onroad mobile sources, which account for approximately 56% and 26%, respectively.[17]

3.5 Maintenance for Growth Milestones

The maintenance for growth will demonstrate maintenance of the 8-hour ozone standard through the year 2012 while accounting for projected population growth. Within the report, an analysis of emissions growth, reduction measures, continuing the planning process, suggestions and recommendations, and an annual review of growth will be provided. A report detailing the methodologies utilized in developing the Maintenance for Growth will be delivered March 31, 2004.

[17] Capital Area Planning Council, University of Texas, and ENVIRON, "Development of the September 13-20, 1999 Base Case Photochemical Model for Austin and San Antonio's Early Action Compacts." November 10, 2003.

Chapter 4 – Conclusion

The San Antonio EAC region has successfully maintained steady progress in accomplishing EAC milestones and ensuring proper development of the Clean Air Plan. Successful completion of the milestones included appropriate participation of stakeholders in the air quality planning process, ongoing development and research of potential control strategies, provide for public participation in the development of the Clean Air Plan, and continue technical activities in developing and testing model performance. The San Antonio EAC region remains compliant with the prescribed milestones as given by the *Protocol for Early Action Compacts Designed to Achieve and Maintain the 8-Hour Ozone Standard.*[18]

[18] The "Protocol for Early Action Compacts Designed to Achieve and Maintain the 8-Hour Ozone Standard" is available online as http://www.epa.gov/ttn/naaqs/ozone/eac/20020619_eac_protocol.pdf